

Claims

1. A first local mobile radio telecommunications network which is connectable to and compatible with a second mobile radio telecommunications network, the first local network comprising: a first and a second radio head for radio communication with one or more user terminals compatible with the second mobile radio telecommunications network; a concentrator connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator; the synchronization and frequency of a local timing signal of each of the first and second radio heads being controlled individually and remotely.
2. The first local mobile radio telecommunications network according to claim 1, wherein the concentrator performs the remote control.
3. The first local mobile radio telecommunications network according to claim 1 or 2, wherein the first and second radio head and the concentrator form one base station.
4. A first local mobile radio telecommunications network which is connectable to and compatible with a second mobile radio telecommunications network, the first local network comprising:
a plurality of radio heads for radio communication with one or more user terminals compatible with the second mobile telecommunications network;
a concentrator connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator; and the concentrator including at least a digital signal processing unit, the digital signal processing unit being a shared resource for the radio heads.
5. The first local mobile radio telecommunications network according to claim 4 or 5 wherein, the concentrator includes at least one of:
a channel coder for channel coding messages to be transmitted from one or more of the radio heads, the channel coder being a shared resource for the one or more radio heads;
a channel decoder, the channel decoder being a shared resource for the one or more

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radio heads;

an equalizer, the equalizer being a shared resource for the one or more radio heads;

a demodulator for demodulating radio samples from the one or more radio heads,
the demodulator being a shared resource for the one or more radio heads,

5 a modulator, the modulator being a shared resource for the one or more radio heads;

a digital filter, the digital filter being a shared resource for the one or more radio
heads;

an encrypter, the encrypter being a shared resource for the one or more radio heads;

a decrypter, the decrypter being a shared resource for the one or more radio heads.

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6. The first local mobile radio telecommunications network according to any of claims 1 to
5, further comprising a scanning unit to scan transmissions from sources of radio energy,
the scanning unit being a shared resource on the local shared resource network.

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7. The first local mobile radio telecommunications network according to any of claims 1 to
6, wherein each of one or more of the radio heads includes at least two fixed gain receiver
amplifiers and a unit for selecting the output of one of the amplifiers.

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8. The first local mobile radio telecommunications network according to claim 6, wherein
the selection unit is adapted to select none of the outputs of the amplifiers of one of the one
or more radio heads.

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9. The first local mobile radio telecommunications network according to any of claims 3 to
8, wherein each of one or more of the radio heads include at least two receivers and each
one or more radio head is adapted to transmit the two received radio signals from the two
receivers to the concentrator via the local shared resource network and the concentrator
includes a selector circuit to select one of the two signals for digital signal processing.

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10. The first local mobile radio telecommunications network according to any of claims 3
to 9, wherein two or more radio heads are adapted to receive signals transmitted from a
user terminal and the concentrator is adapted to combine the signals from the two or more
radio heads before digital signal processing the combined signals.

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11. The first local mobile radio telecommunications network according to any of claims 3 to 9, wherein two or more radio heads are adapted to receive signals transmitted from a user terminal and to transmit these to the concentrator via the local shared resource network and the concentrator is adapted to select the signals from one of the radio heads.

12. The first local mobile radio telecommunications network according to claim 11, wherein the first network is adapted to prevent the received signals of the not-selected radio heads from being transmitted through the local shared resource network.

13. The first local mobile radio telecommunications network according to any of claims 1 to 12, the first network being adapted to transmit a beacon signal from two or more radio heads, each signal being transmitted with a selectable delay.

14. A method of operating a first local radio telecommunications network which is connected to and compatible with a second mobile radio telecommunications network, comprising the steps of: transmitting radio signals from a first and a second radio head to one or more user terminals compatible with the second mobile radio telecommunications network, a concentrator being connected to the local shared resource network, the concentrator and the radio heads being shared resources of a local shared resources network; and remotely controlling the frequency and synchronization of a local timing signal of each of the first and second radio heads individually.

15. The method according to claim 14 wherein the remote control step is performed by the concentrator.

16. A method of operating a first local mobile radio telecommunications network which is connected to and compatible with a second mobile radio telecommunications network, comprising the steps of:

receiving first mobile radio telecommunication signals from one or more user terminals compatible with the second mobile radio telecommunications network at one or more radio heads, the first radio mobile radio telecommunication signals encoding user messages;

transmitting second radio signals derived from the first radio mobile telecommunication signals over a local shared resource network to a concentrator; and digital signal processing the second radio signals in the concentrator.

- 5 17. The method according to claim 15 or 16, further comprising at least one of the following steps in the concentrator:
demodulating radio samples received from the one or more radio heads;
modulating radio samples to be transmitted to one or more radio heads;
channel decoding of radio samples received from the one or more radio heads;
10 channel coding of messages to be transmitted from one or more of the radio heads;
filtering of digital signals to or from the one or more radio heads;
encryption or decryption of digital signals to or from the one or more radio heads;
channel equalization of digital signal to or from the one or more radio heads.
- 15 18. The method according to any of the claims 14 to 17, further comprising the step of scanning transmissions from sources of radio energy.
19. The method according to any of claims 14 to 18, wherein each of one or more of the radio heads includes at least two fixed gain receiver amplifiers, further comprising the step
20 of selecting the output from one the amplifiers.
20. The method according to claim 19, further comprising the step of preventing any of the outputs from the amplifiers of a radio head being transmitted over the local shared resource network.
- 25 21. The method according to any of claims 14 to 19, wherein two or more radio heads are adapted to receive signals transmitted from a user terminal, further comprising the step of combining the signals from the two or more radio heads before digital signal processing the combined signals.
- 30 22. The method according to any of claims 15 to 21, wherein two or more radio heads are adapted to receive signals transmitted from a user terminal, further comprising the steps of:

transmitting the received signals over the local shared resource network to the concentrator and selecting the signals from one of the radio heads in the concentrator for digital signal processing.

- 5 23. The method according to claim 22, further comprising the step of preventing the received signals of the not-selected radio head from being transmitted through the local shared resource network.

- 10 24. The method according to any of claims 14 to 23, further comprising the steps of transmitting a beacon signal from two or more radio heads, each signal being transmitted with a selectable delay.

- 15 25. A concentrator for connection on one side to a mobile radio telecommunications network and for connection on another side for use as a shared resource on a local shared resource network having a plurality of radio heads as shared network components; the concentrator comprising: an interface to the local shared resource network; and the concentrator being adapted to control remotely and for each individual radio head both synchronization and frequency of a local timing signal required for the operation of the radio heads.

- 20 26. A concentrator for connection on one side to a mobile radio telecommunications network and for connection on another side for use as a shared resource on a local shared resource network; the concentrator comprising:

- 25 an interface to the local shared resource network;
 digital signal processing units for processing for transmitting outgoing radio signals to the interface for transmission to a radio transmitter the digital signal processing units being shared resources of the local shared resource network.

- 30 27. A first local radio telecommunications network which is connectable to and compatible with a second mobile radio telecommunications network, the first local network comprising: a plurality of radio heads for radio communication with one or more user terminals compatible with the second mobile radio telecommunications network; a

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concentrator connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator; and a scanning unit to scan transmissions from sources of radio energy, the scanning unit being a shared resource on the local shared resource network.

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28. A first local mobile radio telecommunications network which is connectable to and compatible with a second mobile radio telecommunications network, the first local network comprising: a plurality of radio heads for radio communication with two or more user terminals compatible with the second mobile radio telecommunications network;
10 a concentrator connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator; the two or more radio heads being adapted to receive signals from a user terminal and the first network is adapted to select the signals from one of the radio heads for transmission over the local shared resource network.

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29. The first local network according to claim 28, wherein each of the radio heads includes at least two fixed gain receiver amplifiers and a unit for selecting the output of one of the amplifiers or none of the outputs of the amplifiers.

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30. A first local mobile radio telecommunications network which is connectable to and compatible with a second mobile radio telecommunications network, the first local network comprising: a plurality of radio heads for radio communication with a user terminal compatible with the second mobile radio telecommunications network and for transmitting a plurality of radio signals received each received from the same user terminal to the
25 concentrator, the concentrator being connected to the radio heads by a local shared resource network, the radio heads being shared resources of the concentrator, and the concentrator being adapted to select one or a limited number of the radio signals from the plurality of radio signals from one user terminal for digital signal processing.

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31. A radio head for connection on one side for use as a shared resource on a local shared resource network and on another side for communicating with user terminals of a mobile radio telecommunications network via an air interface; the radio head comprising: a

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network interface to the local shared resource network; and a unit for transmitting to the network interface non-demodulated radio signals received from the user terminals.

- 5 32. A radio head for connection on one side for use as a shared resource on a local shared resource network and on another side for communicating with user terminals of a mobile radio telecommunications network via an air interface; the radio head comprising: a network interface to the local shared resource network; and a first unit for receiving channel coded radio signals from the network interface; and a second unit for modulating the received channel coded signals.

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33. A radio head for connection on one side for use as a shared resource on a local shared resource network and on another side for communicating with user terminals of a radio telecommunications network via an air interface; the radio head comprising: an interface to the local shared resource network; a synchronizing unit for receiving signals from the local shared resource network for remote control of the synchronization and frequency of a local timing signal required for the operation of the radio head.
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